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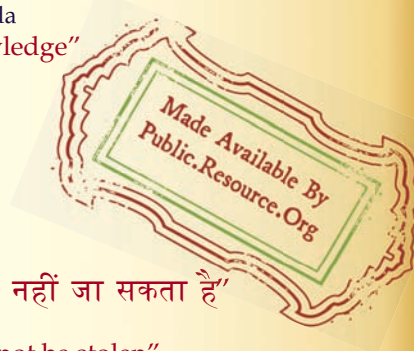
IS 1197 (1970): Code of practice for laying of rubber floors [CED 5: Flooring, Wall Finishing and Roofing]



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*Indian Standard*  
CODE OF PRACTICE FOR  
LAYING OF RUBBER FLOORS  
( *First Revision* )

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**INDIAN STANDARDS INSTITUTION**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

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# Indian Standard

## CODE OF PRACTICE FOR LAYING OF RUBBER FLOORS

### ( First Revision )

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*Indian Standard*  
**CODE OF PRACTICE FOR  
LAYING OF RUBBER FLOORS**  
*( First Revision )*

**0. FOREWORD**

**0.1** This Indian Standard ( First Revision ) was adopted by the Indian Standards Institution on 22 August 1970, after the draft finalized by the Flooring and Plastering Sectional Committee had been approved by the Civil Engineering Division Council.

**0.2** Rubber floor coverings are mainly suitable for use in domestic buildings and those of a non-industrial character, such as schools, hospitals, offices, where the traffic is expected to be essentially pedestrian and also in buses and ships. The rubber floor covering is capable of providing a resilient and noise-free floor surface. It is not possible to be specific about wear resistance of the rubber flooring material, but the life will usually be related to the thickness of the flooring material and to the traffic density. The provision of mats will reduce the amount of abrasive grit carried on to the floor. The durability of rubber floor is increased if the material is laid correctly and maintained carefully. IS : 809-1970\* lays down the requirements for rubber flooring materials both in sheet and tile form. This standard which was first published in 1958 is now being revised in view of the experience gained in the use of the material during the past decade. In this revision the method of laying and fixing of rubber flooring has been covered in great detail.

**0.3** Flooring made from natural rubber is not recommended in situations where it may come into contact with fat, grease, oil or petrol, as these substances may cause swelling, softening or other deterioration. To meet such situations, flooring made from various kinds of synthetic rubber may be utilized.

**0.4** In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country. This has been met by referring to B.S. CP 203 : 1969 'Sheet and tile flooring' published by the British Standards Institution.

\*Specification for rubber flooring materials for general purposes (first revision).

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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## 1. SCOPE

1.1 This code of practice covers the method of laying of rubber floors, in the form of sheet or tiles either solid or backed with fabric, sponge-rubber or plain rubber and their cleaning and maintenance.

## 2. TERMINOLOGY

2.0 For the purpose of this code, the following definitions shall apply.

2.1 **Base** — The prepared surface on which the rubber flooring is laid.

2.2 **Screeded Bed** — A bed of mortar or other material applied to sub-floor and brought to a defined level.

2.3 **Sub-Floor** — A structural floor upon which a base is formed.

## 3. MATERIALS

3.1 Rubber sheets and tiles for flooring shall conform to the requirements of IS : 809-1970†.

3.2 Bitumen mastic for flooring shall conform to IS : 1195-1968‡.

3.3 The adhesive as recommended by the manufacturer should be used. The manufacturer shall also indicate the precautions to be taken while using the adhesive.

## 4. STORAGE

4.1 Rubber flooring materials shall be stored in a clean, dry and well ventilated place not exposed to direct sunlight.

## 5. GENERAL

5.1 The flooring shall be of a type and thickness suitable for the conditions of service. Sheet rubber with sponge-rubber backing shall be used where high resilience is required.

5.2 **Necessary Information** — For efficient planning and execution of flooring work, detailed data and information as given below shall be taken into account:

- a) Area of floor to be covered;

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\*Rules for rounding off numerical values (*revised*).

†Specification for rubber flooring materials for general purposes (*first revision*).

‡Specification for bitumen mastic for flooring (*first revision*).



- b) Type and quality of flooring to be laid;
- c) Thickness of flooring;
- d) Level of the finished floor, relative to a datum;
- e) Type of damp-proofing, if any;
- f) Type and thickness of screeded bed, if any;
- g) Any work consequent upon services passing through the flooring;
- h) Type of underlay, if any;
- j) Treatment of skirting;
- k) Treatment of junction with adjacent flooring; and
- m) Any dressing or polishing required.

## 6. PATTERN AND COLOUR

**6.1** The pattern and colour of the rubber flooring shall be as specified by the purchaser. Where the floor is likely to be exposed to direct sunlight, care shall be exercised in the selection of the colour.

## 7. SUB-FLOOR AND BASE

**7.1 New Concrete Floors** — In the case of newly-laid concrete floors in contact with the ground, a damp-proof membrane or a bitumen mastic layer shall be incorporated in the thickness of the floor and it shall be properly connected with the damp-proof course in walls.

**7.1.1** Special precautions, such as tanking may be necessary against water pressure and to prevent the entry of moisture into floors below ground level.

**7.2 Existing Concrete Floors** — If the floor surface is not smooth and true, it shall be well hacked to provide key for the screeding. It shall then be brought to an even surface with a screeded bed at least 25 mm thick.

**7.2.1** Concrete floors which are in contact with the ground but have not been damp-proofed, shall be covered with a bed of at least 15 mm thick bitumen mastic conforming to IS : 1195-1968\*. Over the bitumen mastic 40 mm thick cement concrete shall be laid.

**7.3 New Timber Floors** — Timber floors designed to receive rubber floor covering shall be constructed with tongued and grooved boarding and shall be adequately ventilated to prevent the onset of dry rot. There should not be any gap between planks which may permit air to penetrate from bottom and affect the bonding of the rubber flooring material with the timber base. Where plywood is used as a base, it shall be of the moisture-proof grade.

\*Specification for bitumen mastic for flooring (first revision).

**7.4 Existing Timber Floors** — Timber floors that are badly worn and those that are not smooth and true shall be repaired and brought to an even and smooth surface. Badly worn floors shall be levelled and smoothed with a filling of bitumen mastic or other suitable material and covered with an underlay fixed with an adhesive or covered with plywood.

**7.5 Metal Floors** — In the case of metal floors, the surface of the metal shall be smooth. Screws, bolts, etc, used in the flooring, shall be of the countersunk type. Where they project above the surface, the metal floor shall be covered with a base bringing the floor to one level before the rubber flooring is laid on. The metal floor should be rust free and a rust proof coating should be applied before the rubber flooring is laid.

**7.6** Before applying any adhesive to the base concrete or mortar, it shall be ascertained that the base is dry. A recommended method for determination of the dryness of the base is given in Appendix A.

## **8. UNDERLAY**

**8.1** An underlay shall be used where the base is of timber. It may also be used when it is necessary to make the flooring quieter, warmer and more resilient. Underlay shall be of either fibre-based saturated bitumen felt (Type 1) conforming to IS : 1322-1970\* or other suitable material approved by the purchaser.

**8.1.1** The underlay shall be butt jointed and so laid that the joints are at 45° to the principal joints in the rubber flooring. The underlay shall be secured by a suitable adhesive except on a timber base in which case it may be nailed.

## **9. LAYING AND FIXING OF RUBBER FLOORING**

**9.1** Skilled workers under efficient supervision shall be employed for laying of rubber floors. The workmanship shall be of a high order.

**9.2** Before commencing the laying operations, the sub-floor shall be examined for evenness and dryness. The sub-floor shall then be cleaned with a dry cloth. The rubber flooring material shall not be laid on a sub-floor unless the sub-floor is perfectly dry (see 7.6).

**9.3** The layout of the rubber flooring on the sub-floor to be covered should be marked with guidelines. The rubber flooring shall be first laid for trial without using the adhesive according to the required layout.

**9.4** The adhesive shall be applied by using a notched trowel (see Fig. 1) to the sub-floor and to the back side of the rubber sheet or tile flooring. When set sufficiently for laying, the adhesive will be tacky to the touch, but will not mark the fingers. In general, the adhesive will require about

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\*Specification for bitumen felts for waterproofing and damp-proofing (second revision).

half an hour for setting, it should not be left after setting for too long a period as the adhesive properties will be lost owing to dust films and other causes.

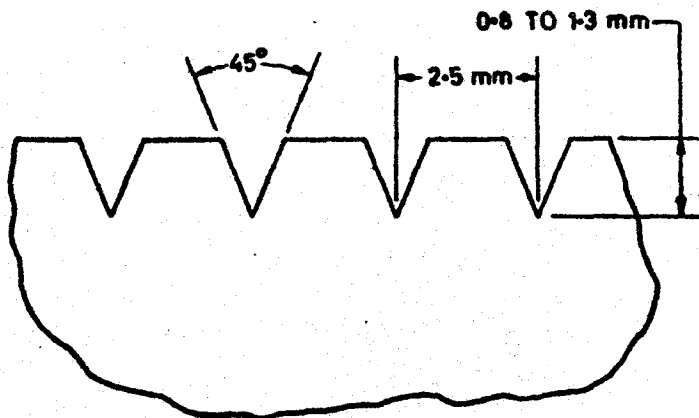


FIG. 1 DETAILS OF A TYPICAL NOTCHED TROWEL

**9.4.1** Care should be taken while laying the flooring under high humidity conditions so that condensation does not take place on the surface of the adhesive. It is preferable to avoid laying under high humidity conditions.

**9.4.2** The area of adhesive to be spread at one time on the sub-floor depends entirely upon local circumstances. In case of a small room, adhesive may be spread over the entire area but relatively small areas should be treated in a larger room.

**9.5** When the adhesive is just tack free, the rubber flooring sheet shall be carefully taken and placed in position from one end onwards slowly so that the air will be completely squeezed out between the sheet and the background surface. After laying the sheet in position, it shall be pressed with suitable roller to develop proper contact with the sub-floor. The next sheet with its back side applied with the adhesive shall be laid edge to edge with the sheet already laid and fixed in exactly the same manner as the first sheet was fixed. The sheets shall be laid edge to edge so that there is minimum gap between joints.

**9.6** The alignment should be checked after laying of each row of sheet is completed. If the alignment is not perfect, the sheets may be trimmed by using a straight edge.

**9.7** The tiles shall be fixed in exactly the same manner as for the sheets. It is preferable to start laying of the tiles from the centre of the area.

Care should be taken that the tiles are laid close to each other with minimum gap between joints. The tiles should always be lowered in position and pressed firmly on to the adhesive. Care should be taken not to slide them as it may result in adhesive being squeezed up between the joints. Rubber flooring tiles after laying shall be rolled with a light wooden roller weighing about 5 kg to ensure full contact with the underlay. Any undulations noticed on the rubber flooring surface shall be rectified by removing and relaying the tiles after thorough cleaning of the under side of the affected tiles. The adhesives applied earlier in such places shall be thoroughly removed by using proper solvents and the surface shall be cleaned to remove the traces of solvents used. Work should be constantly checked against guidelines in order to ensure that all the four edges of adjacent tiles meet accurately.

**9.8** Any adhesive contaminating the face of the rubber flooring should be removed as the work proceeds, care being taken to avoid smearing of adjacent surfaces. The surplus adhesive should not be allowed to remain longer than 24 hours. It should be removed immediately from the rubber flooring because, if allowed to remain until hardened, a solvent may have to be used to remove it which might harm the rubber. In case a solvent is used care shall be taken so that the solvent does not cause any harm to the rubber.

**9.9** A minimum period of 24 hours shall be given after laying the rubber flooring for developing proper bond of the adhesive. During this period, the flooring shall not be put to service. It is preferable to lay the rubber flooring after the completion of plastering, painting and other decorative finish works so as to avoid any accidental damage to the flooring.

**9.10** When the flooring has been securely fixed, it shall be cleaned with a wet cloth, soaked in warm soap solution (two spoons of soap in 5 litres of warm water).

**9.11** In the case of stairs where rubber nosings are to be laid as separate units and these are of a heavier gauge than the tread, the difference in thickness shall be made up in one of the following ways:

- a) In the design of the section of the base in the case of new concrete stairs;
- b) With a screeded bed if the difference in thickness is greater than 12 mm and with a bituminous mastic if it is 12 mm or less in the case of existing concrete stairs; or
- c) With plywood or suitable bitumen mastic in the case of timber floors.

**9.12** Rubber in sheet form shall not be normally used for the formation of coves and skirtings. They shall be formed in moulded or extruded rubber-composition units. The skirtings shall be formed or fixed to cover or mask the joint between the rubber flooring and the wall surface.

## 10. CLEANING AND MAINTENANCE

**10.1** Rubber flooring, requires correct care and maintenance if it is to retain its resilience and attractiveness. In general, exposure to direct sun rays, rain or other atmospheric hazards should be avoided. To avoid damage and to ensure long and efficient service, instructions given below shall be strictly followed.

**10.2** Rubber flooring shall be cleaned by the use of a soap conforming to IS : 285-1964\* and a damp cloth or detergent conforming to IS : 4955-1968†. The following materials shall not be used:

- a) Soft soaps;
- b) Soaps containing liquid essential oils, namely turpentine oil or pine oil;
- c) Soaps containing free alkali;
- d) Pastes or powders containing coarse abrasives;
- e) Scrubbing brushes; and
- f) Petrol benzene, naphtha and similar solvents.

**10.3** Cleaning of rubber floors shall be carried out as follows:

Remove loose dirt with a soft brush; wash the floor in small sections with a piece of cloth or mop, using a 2.5 percent solution of a detergent. The washing cloth shall be rinsed in clean water before application and afterwards the dirty water shall be wrung into a separate pail. Excessive amount of water shall not be used as this may creep between the joints of the rubber floor, and in due course affect the adhesion of the rubber to the sub-floor. Dry the floor as completely as possible to improve the sheen. If the floor is extremely dirty, the cleanser may be allowed to remain on the floor for a few minutes, after which the dirt is removed more easily. If a mechanical washer is used, care shall be taken that the brushes are not too abrasive or the machine itself too heavy, as this may open up the joints in the flooring and allow moisture to seep through. In districts where hard water only is available, a small quantity of household ammonia may be used, say one part in 30 parts of water, and where it is found that stains cannot be removed by cleaning methods, the manufacturer's instructions shall be sought.

**10.4** A wax emulsion polish shall be used for polishing rubber flooring. Polishes containing organic solvents which are injurious to rubber shall not be used.

\*Specification for laundry soaps ( revised ).

†Specification for synthetic detergents for household use.

**10.5** Polishing of rubber floors shall be carried out in the following manner:

Ensure that the floor is thoroughly clean, dry and free from oil and greases. Spread the polish lightly and evenly over the surface with a clean pad of cotton or similar material. It is important not to rub into the flooring. A second application shall be made in the same manner, but approximately an hour shall elapse between the applications. Leave the polish to dry for approximately 30 minutes, depending on the atmospheric conditions and the polish employed. Rub gently with a soft dry cloth until a high lustre is obtained.

**10.6** When the polished floor becomes dirty, loose dirt shall be removed with a soft broom and the floor wiped with a piece of cloth moistened with clean and cold water. No cleanser shall be used, as it will remove the polish. After some time, depending on traffic conditions, the polish may need renewal. The removal of the polish shall be carried out with a detergent solution in water as before for cleaning ( *see* 10.3 ).

## **11. INSPECTION AND TESTING**

**11.1** The finished floor shall be inspected with regard to:

- a) evenness of the surface,
- b) fitting at joints and edges,
- c) adhesion to the base, and
- d) appearance.

## **12. PRECAUTIONS**

**12.1** Rubber floorings are combustible and hence shall not be used where an incombustible flooring is required.

**12.1.1** When heating mains carrying hot water run under the flooring, the pipes shall be lagged or otherwise insulated to prevent possible failure of the adhesive and a tendency for the flooring to curl up.

**12.1.2** When heat radiators are used, they shall be so placed that at least 15 cm clear space is left between the flooring and the face of the radiator.

**12.2** Rubber flooring surface, if wet, may become dangerously slippery. If floors are likely to be in the wet condition, ribbed or fluted type of flooring shall be used.

**12.2.1** Collection of pools of water on the flooring shall be avoided to prevent staining.

**12.3** Some colours are likely to change in shade or get damaged in other ways when brought into contact with certain materials, such as mineral oils, petrol, methylated spirit, acid and alkali. Hence consideration shall be given to the conditions of use of the floor on which rubber flooring is



to be laid and tests conducted, if necessary, before deciding upon the colour of the flooring.

**12.4** Scrubbing of rubber floors with strongly alkaline soaps, with detergents not having a soap base or with cleansing agents, or the lavish use of water in washing are injurious; the excessively gritty particles of some cleansing agents tend to roughen the surface, thus making it difficult to clean, and a profusion of water may tend to seep between the joints thus causing the failure of the adhesive.

**12.5** Skirting (preferably wooden) of about 20 mm thickness should be provided around the border line of rubber flooring to eliminate possible percolation of water used for the cleaning of rubber floors.

## **A P P E N D I X   A**

( *Clause 7.6* )

### **DETERMINATION OF DRYNESS OF SUB-FLOORS AND BASE**

#### **A-1. GENERAL**

**A-1.1** A mortar base shall be deemed to be sufficiently dry to receive the flooring if a hygrometer shows that the relative humidity of a small volume of air, in equilibrium with the surface of the base but isolated from the air of the room, does not exceed 80 percent.

#### **A-2. APPARATUS**

**A-2.1** The apparatus consists of a hygrometer carried in a casing which is adapted to confine a quantity of air on being placed against the surface to be tested.

**A-2.2** The hygrometer shall be verified (preferably on the site) by exposure for four hours to ( air in equilibrium with ) a water surface when it indicates a relative humidity of 100 percent.

#### **A-3. PROCEDURE**

**A-3.1** Set the instrument in position on the base to be tested. Allow the instrument to stand in this position for not less than four hours to allow equilibrium to be established. Then take the reading. Similarly, take a number of readings, the interval between consecutive readings being not less than four hours.

#### **A-4. EVALUATION**

**A-4.1** The base shall be deemed to be dry when all the hygrometer readings show a value of 80 percent relative humidity or less.

# INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

## Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

## Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

## Derived Units

Quantity	Unit	Symbol	Conversion
Force	newton	N	1 N = 1 kg·m/s <sup>2</sup>
Energy	joule	J	1 J = 1 N·m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V·s
Flux density	tesla	T	1 T = 1 Wb/m <sup>2</sup>
Frequency	hertz	Hz	1 Hz = 1 c/s (s <sup>-1</sup> )
Electric conductance	siemens	S	1 S = 1 A/V
Pressure, stress	pascal	Pa	1 Pa = 1 N/m <sup>2</sup>

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